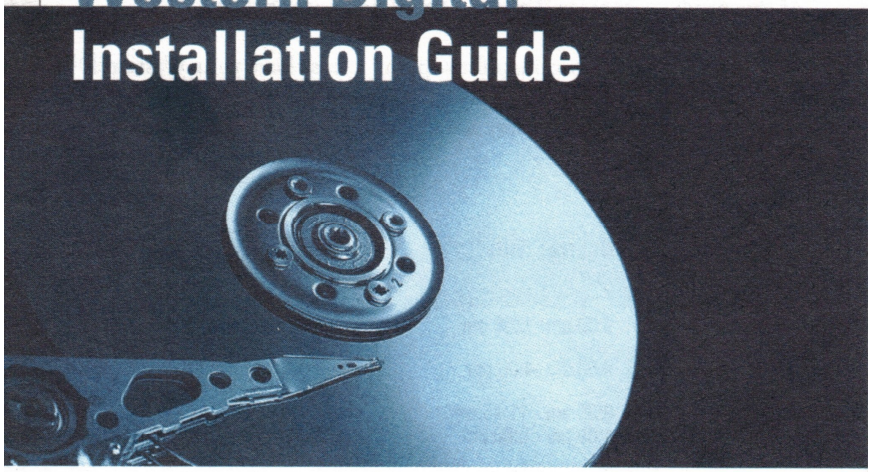
Western Digital
Installation Guide



Western® Digital

Technical Support Services

Online Service: **www.westerndigital.com**

Telephone Assistance: **800.ASK.4WDC (800.275.4932) or 507.286.7900 USA/Canada/Outside USA**

+31.20.446.7651 for Europe

If you need additional information or help during installation or normal use of this product, contact Western Digital Technical Support.

IMPORTANT: When calling for support, please have your Western Digital hard drive serial number and system hardware and software versions available as certain sevices may not be available without the drive model and serial number.

USA/Canada	Central Time	Outside USA / Canada	Pacific Time
Monday - Thursday	9:00 am - 6:00 pm	Monday - Thursday	8:00 am - 5:00 pm
Friday	9:00 am -4:00 pm	Friday	8:00 am - 3:00 pm
Saturday	8:00 am - 11:45 am 1:00 pm - 5:00 pm		

Online Product Registration

Take advantage of various Western Digital offerings by registering your hard drive on our web site at www.westerndigital.com.

Western® Digital

Western Digital EIDE Hard Drives

Installation Guide

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Contents

1 Getting Started
Unpacking and Handling 1
Record Your New Hard Drive Information 2
Protect Your Data 3
Installation Setup 3
Opening Your Computer 3
5.25-inch Drive Bay 5
Standard Jumper Settings 6
General Information for Cable Select Configuration 7
Determining If Your System is Cable Select Compliant . . . 8
Cable Select Configuration Options for PC Systems 9
General Information for Master/Slave Configuration 10
Master/Slave Configuration for PC Systems 10
Configuration Options for Apple Installations 12

13 Hardware Installation

18 Software Installation
Before Using Data Lifeguard EZ-Install Software 18
Operating System Compatibility 20
Disabling Floppy Boot Protection 21
Using Data Lifeguard EZ-Install Software 21

25 Data Lifeguard Tools
Data Lifeguard Diagnostics 25
Using Data Lifeguard Diagnostics 25
Data Lifeguard Ultra ATA/100 Management 29
Requirements for Ultra ATA/100 29
Data Lifeguard BIOS Check 30
Using Data Lifeguard BIOS Check 30

Data Lifeguard Lifeline 31
Uninstalling Data Lifeguard Lifeline 31

32 Troubleshooting
Operating System and System BIOS Limitations 32
32 GB Barrier 32
8.4 GB Barrier 33
2.1 GB Barrier 34
528 MB Barrier 35
Alternate Jumper Settings 36
Computer System Manufacturers 37
Common System BIOS Sources 37
Other Drive Manufacturers 38
Western Digital Technical Support 38

39 Appendix
Agency Approvals 39
Federal Communication Commission 39
Underwriters Laboratories 39
Canadian Standards Association 39
TUV Essen Laboratories 39
CE Compliance For Europe 40
Radio Frequency Interference Statement 40
FCC Notice 40
CSA Notice 40
Warranty Information 41
Obtaining Service 41
Return Material Authorization 41
Limited Warranty 42
Duration of Warranty 42
Other Warranty Limitations 42
Disclaimer of Warranties 42
Your Use of the Product 43

Limitation of Remedies 43
Limitation of Damages 44
No Consequential or Other Damages 44
Online Warranty Inquiry 44
Extended Warranty 44

Getting Started

This installation guide provides concise instructions and illustrations to make the installation of your new Western Digital hard drive as quick and easy as possible.

Unpacking and Handling

Western Digital hard drives are precision instruments and should be handled with care during unpacking and installation. Hard drives can be damaged by rough handling, shock and vibration, or electrostatic discharge (ESD). Be aware of the following precautions when unpacking and installing your Western Digital hard drive.

- Do not unpack your hard drive until you are ready to install it. Your hard drive is packaged in a static shielding bag. Use this bag to place your hard drive on after unpacking.
- Save the packing materials in case you need to return your hard drive. Your warranty will be void if your returned hard drive is shipped in anything other than the original packaging or Western Digital supplied or approved materials.
- To avoid ESD problems, ground yourself by touching the metal chassis of the computer before handling the hard drive. Articles of clothing generate static electricity. Do not allow clothing to come in direct contact with the hard drive or circuit board components.
- Handle the hard drive by the sides only. Avoid touching the circuit board components.
- Do not drop or knock the hard drive.
- Do not stack hard drives or stand your Western Digital hard drive on its edge.

Record Your New Hard Drive Information

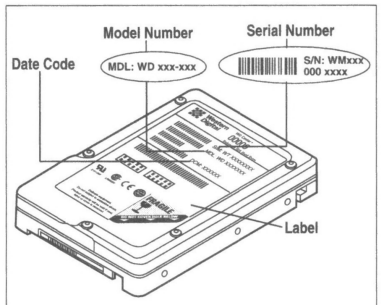
In the table that follows, write down the serial number, model number, and date code listed on your new Western Digital hard drive. The complete serial number, model number and date code are on the large label at the top of the drive. See the illustrations below.

You can also use the Data Lifeguard™ Diagnostic Utility to identify your model number, serial number, and date code (see page 25 for more details). You will need this information to register your hard drive and for contacting technical support. To register your hard drive, visit our web site at **www.westerndigital.com**

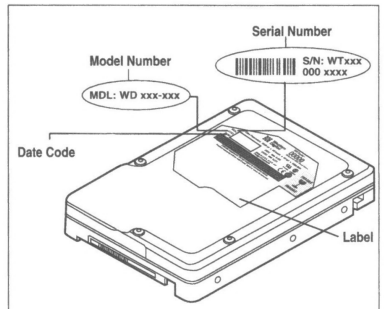
IMPORTANT: When calling for support, please have your Western Digital hard drive serial number and system hardware and software versions available as certain services may not be available without the drive model and serial number.

Caution: Do not remove, tear, or damage the tape seal or any labels from the drive; these actions void the warranty.

Serial Number:	
Model Number:	Date Code:



Western Digital Hard Drive
(10-pin connector)



Western Digital Hard Drive
(9-pin connector)

Gather These Supplies:

- Computer system manual
- Operating system installation disks or CD-ROM
- Operating system manual
- Small Phillips and flat-blade screwdrivers
- Bootable DOS disk, Windows 95/98 Startup disk, or Windows Me Startup disk

Protect Your Data

Protect your data by backing up your existing hard drive before installing your new Western Digital hard drive. Save the data to removable media such as a floppy disk, tape drive, zip drive, etc. Most operating systems include a backup utility. Consult your operating system or utilities documentation for backup instructions.

Installation Setup

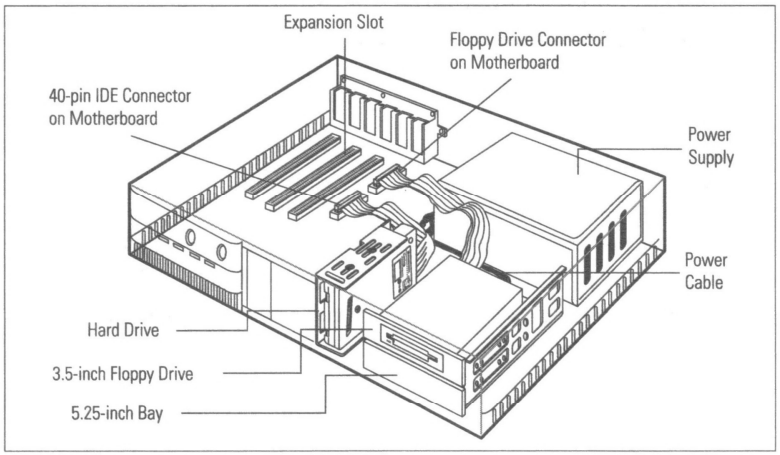
Opening Your Computer

1. Turn off your system.
2. Discharge static electricity by touching the metal chassis of the computer.
3. Unplug your computer.
4. Remove the computer's outside cover (refer to your computer system manual for instructions).

The graphics on the following pages identify some of the system components involved in a hard drive installation.

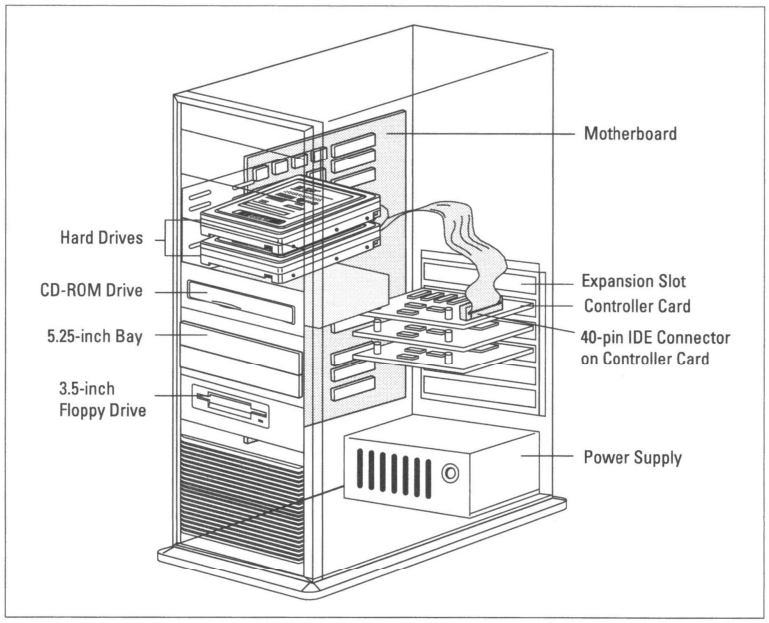
Connecting the Hard Drive to the Motherboard

This graphic illustrates connecting your new hard drive to the 40-pin IDE connector in a typical desktop PC.



Connecting the Hard Drive to a Controller Card

Choose this option if you are connecting your new hard drive to the 40-pin IDE connector on a controller card in a typical tower system.



5.25-inch Drive Bay

If installing your new Western Digital hard drive in a 5.25-inch bay, you may need to install 5.25-inch mounting hardware. If you do not have mounting brackets contact your system manufacturer, your local computer dealer, or call Western Digital's technical support.

Standard Jumper Settings

Jumper settings are used to determine the order in which IDE devices (i.e. hard drives, CD-ROM, etc.), attached to a single cable, are detected by the system. To determine the appropriate jumper settings for your new Western Digital hard drive, please read the following information and examples.

Western Digital IDE hard drives have a 10-pin jumper block located next to the 40-pin IDE connector on the hard drive. See the illustrations that follow and use the jumper setting instructions that match your system and device requirements. The default jumper setting for Western Digital hard drives is Cable Select.

If your system locks up because of a BIOS limitation, see page 36 for detailed information on Alternate Jumper settings.

Basic IDE Configuration Information

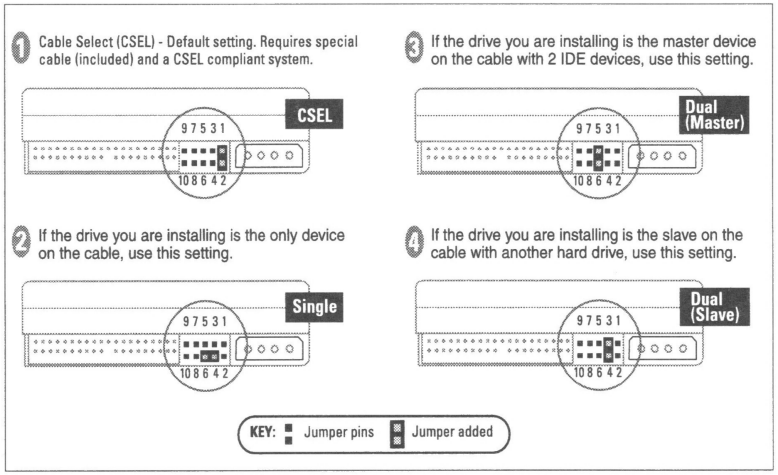
For nearly all IDE devices, there are two configuration protocols used to determine the order in which a device on a cable is detected by the system. In the past, the most common method was the Master/Slave configuration, but the industry standard is moving towards a more user-friendly method, called Cable Select (CSEL). However, not all computer systems and IDE devices support the Cable Select option. To determine if your system is Cable Select compliant, see page 8.

> *Note:* Both the Master/Slave and Cable Select methods refer to having multiple devices attached to the same IDE cable. If you are only connecting one IDE device to a cable, then it is considered to be a Single drive. Both the Master/Slave and Cable Select configurations have options for Single drive installations. Please keep this information in mind when determining how to configure your IDE devices.

Standard Jumper Settings for 10-pin Western Digital Hard Drives

Tips: Not all hard drive manufacturers use the same jumper configurations. If you are installing your new Western Digital hard drive along with a non-Western Digital hard drive, obtain jumper setting information from the Data Lifeguard EZ-Install software found on the Data Lifeguard Tools disk, or from your original drive manufacturer. See "Other Drive Manufacturers" on page 38 for the phone numbers and internet addresses of other hard drive manufacturers.

The Master/Slave settings on Western Digital drives are used only when there is another device on the same cable with the hard drive. If the hard drive is the only device on the cable, jumper it as a Single drive.



General Information for Cable Select Configuration

To configure two IDE devices for Cable Select, the hard drives must be properly jumpered with the Cable Select setting. Using the included 40-pin, 80-conductor cable, connect the drives to determine the order in which they are detected. The Master drive is connected to the end of the cable, the Slave drive in the middle, and

the motherboard at the other end. The drive configuration can easily be switched by changing which connector on the cable is used. Thus, devices can be installed easily without having to change jumpers on two devices anytime it is installed or removed.

If multiple IDE ports are used, each port has its own Cable Select configuration. The primary IDE port is ordered first, then the secondary, and so forth. Therefore, it is possible to have two Master drives and two Slave drives.

Determining If Your System is Cable Select Compliant

Since not all computer systems and motherboards have implemented support for Cable Select, it is necessary to determine which configuration method can be used. If Cable Select is not supported or if you are uncertain, use the Master/Slave configuration.

> *Note:* The Master/Slave configuration will take precedence over Cable Select. Even if the system, devices, and cable all support Cable Select, jumpering the devices as Master/Slave will work and thus override Cable Select.

There are several ways to determine if your system or motherboard supports Cable Select:

1. ***Previous Configuration:*** If you currently have an IDE device installed in your system, check its configuration. Every IDE device has a jumper block on it, and most have the explanation of the jumpers located on the top of the device. Check the installed device's configuration to see if it is jumpered for Cable Select. If it is, then you know that your system will support it.

2. ***System Documentation:*** If you do not have an IDE device installed in your system, or it is not configured for Cable Select, reading your system documentation should indicate whether this feature is supported.

3. ***System Manufacturer:*** If you do not have an IDE device installed in your system, or if it is not configured for Cable Select and your system documentation does not state the support for Cable Select, contact your system or motherboard manufacturer (i.e. via phone, e-mail, web site) for more information. A list of common computer system manufacturers and BIOS sources is listed on page 37.

Cable Select Configuration Options for PC Systems

If you have determined that your system and all other IDE devices support Cable Select, please use the following information to connect your new Western Digital IDE hard drive (see page 8 to determine if your system is Cable Select compliant).

Installing the new drive as the only drive in the system:
If connecting your new Western Digital hard drive as the only IDE drive on the cable, then there is no need to change the jumper pin on the drive.

Once the jumper has been configured, connect the drive to the black connector at the end of the cable.

Installing the new drive as the primary (Master) drive:
If connecting your new Western Digital hard drive as the primary drive on the cable with another IDE drive, there is no need to change the jumper pin on the drive. Jumper the other IDE drive as Cable Select (see "Other Drive Manufacturers" on page 38 for contact information on how to jumper a non-Western Digital drive).

Connect the drive to the black connector at the end of the cable for the system and the other IDE drive to the gray connector located at the middle of the cable.

Installing the new drive as the secondary (Slave) drive:
If connecting your new Western Digital hard drive as the

secondary drive on the cable with another IDE drive, there is no need to change the jumper pin on the drive. Jumper the other IDE drive as Cable Select (see "Other Drive Manufacturers" on page 38 for contact information on how to properly jumper a non-Western Digital drive).

Connect the drive to the gray connector in the middle of the cable and other IDE drive to the black connector located at the end of the cable.

For further information on Cable Select, please visit our web site at www.westerndigital.com and go to **Service and Support**.

General Information for Master/Slave Configuration

To set up the Master/Slave configuration, one device on the cable must be jumpered as Master (thus designated as the primary device), and the other jumpered as Slave (now designated as the secondary device). With this jumper setting, the placement of the devices connected to the cable does not matter. A device jumpered as Master could be connected either at the middle or end of the cable, and the order of detection would not be affected.

If multiple IDE ports are used, each port has its own Master/Slave configuration. The primary IDE port is ordered first, then the secondary, and so forth. Therefore, it is possible to have two Master drives and two Slave drives.

Master/Slave Configuration for PC Systems

If you determined that your system does not support Cable Select or if you are uncertain, use the following information to properly connect your new Western Digital IDE hard drive.

Installing the new drive as the only drive in the system:
If connecting your new Western Digital hard drive as the only IDE device on the cable, then move the jumper on the drive from pins 1 & 2 to pins 4 & 6 (see page 7 for a diagram of the jumper block).

Once the jumpers have been configured, connect the drive to the black connector at the end of the cable.

Installing the new drive as the primary (Master) drive:
If connecting your new Western Digital hard drive as the Master drive on the cable with another IDE device, move the jumper on the drive from pins 1 & 2 to pins 5 & 6 (see page 7 for a diagram of the jumper block). Then configure the jumper on the other IDE device as Slave (see "Other Drive Manufacturers" on page 38 for contact information on how to jumper a non-Western Digital drive).

Connect the drive to the black connector at the end of the cable. Then connect the other IDE device to the gray connector located at the middle of the cable.

Installing the new drive as the secondary (Slave) drive:
If connecting your new Western Digital hard drive as the secondary drive on the cable with another IDE device, move the jumper on the drive from pins 1 & 2 to pins 3 & 4 (see page 7 for a diagram of the jumper block). Then configure the jumper on the other IDE device as Master (see "Other Drive Manufacturers" on page 38 for contact information on how to jumper a non-Western Digital drive).

Connect the drive to the gray connector at the middle of the cable, and the other IDE device to the black connector located at the end of the cable.

Configuration Options for Apple Installations

Some PowerMac™ G3 and all PowerMac G4 computers support the Master/Slave configuration. If your system does not support the Master/Slave configuration, you will be limited to installing one IDE device per channel (for a maximum of two IDE devices).

You can install two IDE devices on the same cable with the Master/Slave configuration on the following Apple Computers:

- PowerMac G4 and higher
- PowerMac G3 (blue and white colored, limited to certain configurations)
- PowerMac G3 All-in-One

A PowerMac G3 with a U-shaped mounting bracket installed in the rear drive bay is capable of supporting multiple IDE devices. For more information on determining the capability of your PowerMac G3, see Apple Knowledgebase Article 24343 at www.apple.com.

Recommendations and Tips

- Never install an IDE drive as a slave to a CD-ROM, CD-RW, DVD, or zip drive. These devices operate at a slower transfer rate, and can cause problems communicating with the hard drive.
- In any multiple drive configuration, it is important to determine which drive you want to boot from. If you wish to keep your existing boot drive, then the new Western Digital drive should be installed as the secondary or Slave drive.

  Note: The included installation software (Data Lifeguard EZ-Install) can copy the data from your existing drive, so that your new Western Digital drive will be the bootable drive.

Hardware Installation

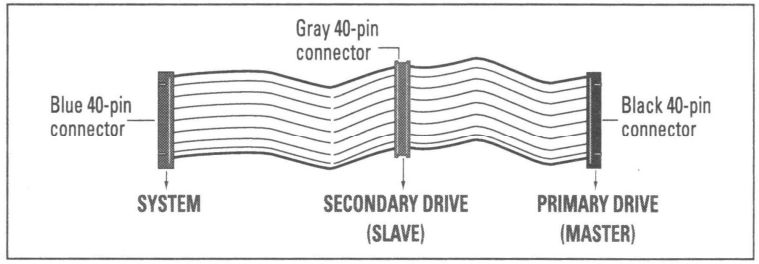
Caution: Before you perform any hardware installation, make sure to back up your data.

There are four basic steps in a successful hardware installation:

- Verify that your jumper settings are correct
- Connect your IDE interface cable
- Connect your power supply cable
- Fasten your hard drive into the drive bay

IMPORTANT: Your system must be turned off before connecting or disconnecting any cables to the drive.

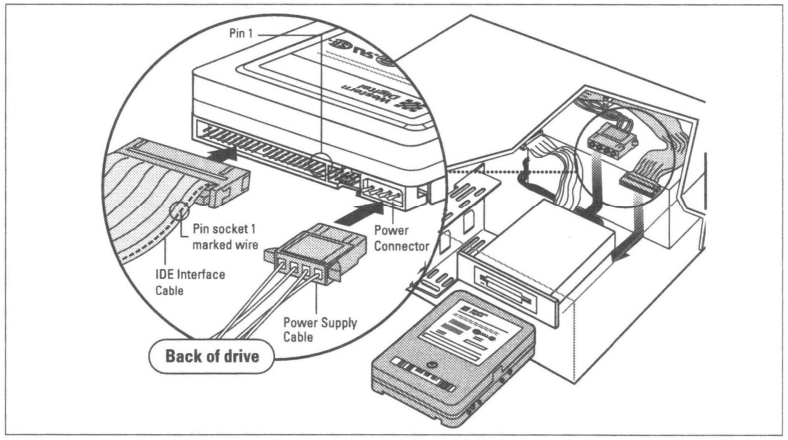
1. ***Jumper Settings:*** Verify that your jumper settings are correct before proceeding. See page 6 for Standard Jumper Settings. For Alternate Jumper Settings, see page 36.
2. ***IDE Interface Cable:*** A 40-pin, 80-conductor IDE interface cable is included in your hard drive package. Use this new IDE interface cable to obtain Ultra ATA/100 performance (see page 29 for other requirements). Thread the IDE interface cable through the empty bay and slide in your Western Digital hard drive.



40-pin, 80-conductor IDE Interface Cable
ATA/100 and ATA/66 compatible - supports up to two EIDE devices

Note: Use the middle connector ONLY for a slave drive. Use the black (end) connector for either a Master or Single drive.

For Apple Installations: Use an Apple-supplied interface cable only. Do not use the IDE interface cable in this package.



Attaching the IDE Interface Cable and Power Supply to the Hard Drive

A. ***Connect the IDE Interface Cable to the Hard Drive(s)***
When installing a hard drive as the only drive in the system: Connect the black end of the 40-pin, 80-conductor IDE

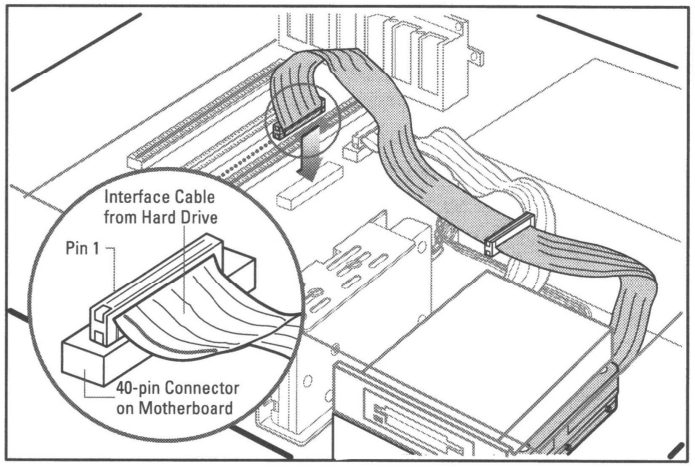
interface cable to the Western Digital hard drive. Match pin socket 1 (indicated by a color stripe on the cable) on the IDE interface cable to pin 1 (next to the drive power connector) on the Western Digital hard drive.

When installing a hard drive as the second drive in the system: Connect the two hard drives to the gray (slave) and black (master) ends of the 40-pin, 80-conductor IDE interface cable. Match pin socket 1 (indicated by a color stripe on the cable) on the IDE interface cable to pin 1 (next to the drive power connector) on the Western Digital hard drive.

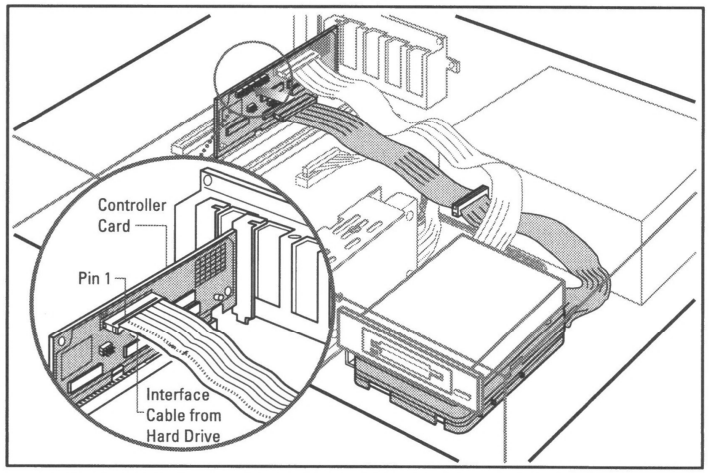
Tip: If you already have two hard drives installed, connect any other IDE devices, such as CD-ROMS, to the secondary cable.

B. ***Connect the IDE Interface Cable to the Motherboard or Controller.*** Attach the blue end of the 40-pin, 80-conductor IDE interface cable to the 40-pin connector on the motherboard or controller card. Match pin socket 1 on the IDE interface cable (indicated by a color stripe on the cable) to

pin 1 on the motherboard or controller card.



Attaching the IDE Interface Cable to the Motherboard



Attaching the IDE Interface Cable to the Controller Card

3. ***Power Supply Cable:*** Attach the computer system power supply cable to the 4-pin power connector on the back of your new Western Digital hard drive. The 4-pin connector is keyed to ensure proper insertion.

4. ***Secure the Hard Drive in the Drive Bay:*** Secure the Western Digital hard drive in the drive bay using the four mounting screws provided. For proper grounding, be sure to use ALL FOUR screws.

Before replacing the system cover, we recommend checking all cable connections. Plug in your computer and proceed to the *Software Installation* section.

Software Installation

Data Lifeguard™ EZ-Install software is included on the Data Lifeguard Tools disk that ships with Western Digital hard drives to:

- Overcome the 32 GB, 8.4 GB, 2.1 GB, and 528 MB system BIOS limitations
- Partition and format your new hard drive
- Copy system files needed to boot your new hard drive
- Copy the contents of an existing hard drive onto your new hard drive (optional)
- Install Data Lifeguard Lifeline

Before Using Data Lifeguard EZ-Install Software

Before partitioning and formatting your hard drive, you must tell the system what type of hardware you are using. This is referred to as "configuring the system BIOS." Your computer system provides an initial setup utility (CMOS Setup) for that purpose.

Each system BIOS is different. The information supplied here is not meant to be followed step-by-step, but is provided as a guideline. Refer to your system manual for details.

If you have an older system, it may be necessary for you to upgrade your system BIOS, install an EIDE controller card, or use the included Data Lifeguard Tools software to access the full capacity of your hard drive (see *"Operating System and System BIOS Limitations"* on page 32 for specific operating system and BIOS limitations information).

Consider the following capacity points and dates:

System BIOS Dates	BIOS Support Issues
Prior to August 1994	May not support hard drives larger than 528 MB
Prior to February 1996	May not support hard drives larger than 2.1 GB
Prior to January 1998	May not support hard drives larger than 8.4 GB
Prior to June 1999	May not support hard drives larger than 32 GB

To configure your system BIOS:

1. Enter your CMOS setup program (sometimes called the Setup program). Systems vary, but pressing one of these keys should gain access to your CMOS setup: F1, F2, or DELETE. Refer to your system manual for instructions. *Note:* During your system boot, a message is typically displayed after the memory count indicating how to enter Setup.

   If your system does not respond (locks up) on initial boot, see "Alternate Jumper Settings" on page 36.

2. Find any IDE **Autodetection** option that may be present in your BIOS. If given a choice, select the LBA option and enable it. In some cases, LBA will be an option under IDE Translation Mode. In other systems, **Autodetection** is preselected.

   If your system BIOS does not have an auto config drive type or does not show full capacity, disable LBA, select **User Defined**, and enter **1023 cylinders, 16 heads, and 63 sectors** for the drive parameters. Selecting **User Defined** ensures that EZ-Install will install on your system.

   If your system BIOS does not have auto config or **User Defined**, select **Type 9**. Selecting **Type 9** ensures that EZ-BIOS will install on your system.

3. Enable options such as LBA or Translation Mode available in most current system BIOSs.

   If you do not have either option, you must either use Data Lifeguard EZ-Install to install your new hard drive, upgrade the system BIOS, or install an EIDE controller card with onboard BIOS that supports the full drive capacity. See page 37 for a list of common system BIOS sources and phone numbers.

Operating System Compatibility

You can use Data Lifeguard EZ-Install software with these operating systems:

- Windows 3.x all versions, Windows 95 all versions (*Note:* Windows 95 does not support more than 32 GB), Windows 98 all versions, and Windows Me all versions
- Windows 2000, Windows NT 3.51 and 4.0
- OS/2 Warp 3.0 and 4.0
- DOS 5.0 and later (*Note:* DOS does not support more than 8025 MB)

Windows NT 3.51 and 4.0 and OS/2 Warp 3.0 and 4.0 DO NOT support the Data Lifeguard EZ-Install software floppy boot protection scheme. If using one of these operating systems, you must disable floppy boot protection immediately after installing Data Lifeguard EZ-Install software. See "Disabling Floppy Boot Protection" on page 21 for instructions.

Tip: Data Lifeguard EZ-Install is not needed with Windows NT or Windows 2000, unless the BIOS stalls on greater than 32 GB drives. In most cases, Windows NT or Windows 2000 setup for the hard drive is sufficient. To dual-boot multiple operating systems, ensure that the BIOS or controller card BIOS supports the full capacity of the hard drive.

IMPORTANT: You cannot use Data Lifeguard EZ-Install software with these operating systems:

- Macintosh
- Novell NetWare
- Unix (including Linux)

If using an Apple computer, partition and format your new hard drive with the Apple Drive Setup software. If using Unix or Novell NetWare consult your operating system manual to partition and format your hard drive.

Disabling Floppy Boot Protection

1. After the installation, reboot or turn on your system with the Data Lifeguard Tools disk in your floppy drive.
2. Select **EZ-Install** from the main menu and press ENTER.
3. At the main menu of EZ-Install, select **Advanced Options** and press ENTER.
4. Select **EZ-BIOS Setup** from the Advanced Options menu and press ENTER.
5. Select **Floppy Boot Protection** and press ENTER to disable.
6. Select **Save Changes** and press ENTER.
7. Exit EZ-Install and remove the floppy disk from the floppy drive.
8. Reboot your system.

Using Data Lifeguard EZ-Install Software

Follow the steps outlined below to set up your hard drive. These steps are provided as a guideline.

1. Insert the Data Lifeguard Tools disk into drive A.

2. Reboot or turn on the system.
3. The Data Lifeguard introduction screen displays. Press ENTER to continue.
4. From the Data Lifeguard Tools main menu, select **EZ-Install**, then press ENTER.

   Note: If the Data Lifeguard Tools Diagnostic utility reports no Western Digital Drives present, the hard drive is not being properly detected. Check the previous steps, especially the cabling and jumper settings.
5. The Data Lifeguard EZ-Install software Welcome screen displays. Press ENTER to continue.
6. The Data Lifeguard EZ-Install software license agreement displays. Press ENTER to begin installation.
7. From the Data Lifeguard EZ-Install main menu, select **Fully Automatic Install** to set up the hard drive.
8. In second hard drive installations, Data Lifeguard EZ-Install detects and displays the new Western Digital hard drive. If the selected drive is the one you want to partition and format, select **Yes** to set up your hard drive.
9. ***Copy System Files:***
   When installing a hard drive as the only drive in the system: From the Copy System Files screen, insert a DOS, Windows 95, 98, or Windows Me Startup disk. It is important to insert the same version of the operating system disk as you are planning to install after using Data Lifeguard EZ-Install. Press ENTER to continue setup.

   IMPORTANT: Data Lifeguard EZ-Install copies system files needed to boot the hard drive. It does not install the operating system. You need to complete the operating system installation after installing Data Lifeguard EZ-Install.

When installing a hard drive as the second drive in the system: Select **Copy System Files** to make the hard drive bootable. Select **Copy Drive...** to copy the contents of an existing drive to the new hard drive.

IMPORTANT: Due to how Windows Me boots, System Files copied to a drive using a Windows Me Boot Disk will not make the drive bootable. To boot to the drive, you must install Windows Me.

10. Two additional screens display if your system supports FAT32 partitions. Proceed to step 12 if your system only supports FAT16 partitions.

> **Caution:** Repartitioning an existing drive destroys all the data. Be sure to create a backup before repartitioning an existing drive.

Select **Yes** to accept the FAT32 partition, or select **No** to use multiple FAT16 partitions. Then press ENTER.

Select **Use This Partition Size** to accept the default partition sizes. This defaults to full capacity when using FAT32. Select **Enter New Partition Sizes** to create custom partitions.

To complete the Data Lifeguard EZ-Install, proceed to Step 13

11. This alternate screen displays for FAT16 partitions. From the Partition and Format screen, select **Use These Partition Sizes** to accept the default partition sizes. Select **Enter New Partition Sizes** to create custom partitions.

DOS, Windows 3.1x, and early versions of Windows 95 use FAT16 file systems which have a 2.1 GB partition limit. You must create multiple partitions on hard drives larger than

2.1 GB. Do not create a partition larger than 2.1 GB. Select **Continue Setup** to have EZ-Install set up the hard drive.

12. After the system files are copied to the drive, you will be prompted for the Data Lifeguard Tools disk. Insert the disk into the floppy drive. The utility will copy the Data Lifeguard Lifeline files onto the drive.

13. Your hard drive is now partitioned, formatted, and ready for use. When the Hard Drive Setup Complete screen displays, remove the disk from the floppy drive and press ESC to reboot the system.

Note: Do not insert a floppy disk into the A drive until prompted. If a C:\> prompt appears on the first reboot after installation and a message about EZ-BIOS did not display, EZ-BIOS did not install because the drive is supported by your system. To install the operating system from this point, reboot to the appropriate floppy disk or CD-ROM if both computer and operating system support installation from the CD-ROM.

If a message about EZ-BIOS does display, when prompted, hold down the Control key to boot from a floppy. This action is required every time the system needs to be started with a floppy disk instead of booting to the hard drive.

To properly start your operating system support installation with EZ-BIOS loaded, you must first turn on the system with no floppy in the A: drive. Then when prompted, hold down the Control key. Insert the Startup Disk when prompted on the next screen. From here the operating system will install and properly recognize your hard drive.

If this was a single hard drive installation, then you are now ready to install your operating system. See your operating system manual for installation instructions.

Data Lifeguard Tools

Western Digital provides a set of software programs called Data Lifeguard Tools to assist with hard drive installation, drive management, and repair.

Data Lifeguard Tools	Function
Data Lifeguard EZ-Install	Partitions, formats, and copies hard drives
Data Lifeguard Diagnostics	Identifies and repairs most drive errors
Data Lifeguard BIOS Check	Provides information for technical support
Data Lifeguard Ultra ATA/100 Management	Manages Ultra ATA/100 functions (including ATA 66 and 33)
Data Lifeguard Lifeline	Enables your system to receive notices from Western Digital in the event of an important announcement about your drive

Data Lifeguard EZ-Install was presented in the *Installation Software* section. This section contains information on these programs:

- Data Lifeguard Diagnostics
- Data Lifeguard Ultra ATA/100 Management
- Data Lifeguard BIOS Check
- Data Lifeguard Lifeline

Data Lifeguard Diagnostics

Data Lifeguard Diagnostics is included on the Data Lifeguard Tools disk. This utility was designed especially for Western Digital hard drives to diagnose and fix most common hard drive problems.

When to use Data Lifeguard Diagnostics

- if the hard drive reports errors
- if you are unable to access files on the hard drive
- if another diagnostic utility such as SCANDISK, CHKDISK, or DEFRAG reports errors on the hard drive

Using Data Lifeguard Diagnostics

Data Lifeguard Diagnostics does not overwrite data on the hard drive during the scan, and if used properly, will not result in data loss. Always back up your data before running any diagnostic utility.

1. Insert the Data Lifeguard Tools disk into drive A.
2. Reboot or turn on the system. Do not run Data Lifeguard Diagnostics while Windows 95 or 98 or Windows Me is active.

   Caution: Data Lifeguard is for use in DOS only. Do not use within any other operating system or DOS shell.

3. The Data Lifeguard Tools main menu displays. Select **Diagnostics.**
4. From the Data Lifeguard Diagnostics main menu, choose **Select Drive and View Status** to display a list of all drives installed and the current status of each drive. Test each drive separately.

   Note: Code 0202 indicates the drive has not yet been tested. All drives display this code when first selected for testing.

Caution: Do not select the "Write Zeros to Drive" option unless instructed to do so by qualified technical support personnel. This option will erase all data on the drive.

5. Use the UP/DOWN ARROW keys to highlight the desired drive and press ENTER to return to the main menu. The Hard Drive Recognition window displays information about the selected drive.

   If the Hard Drive Recognition window displays the correct drive information, continue with step 6.

   If the Hard Drive Recognition window displays incorrect information, then Data Lifeguard Diagnostics is not communicating with the hard drive. Check your BIOS setup, all cables connected to the hard drive, and the jumper settings on the hard drive.

6. There are two test options on the Data Lifeguard Diagnostics main menu - **Quick Test** and **Extended Test.**

   Quick Test accesses Data Lifeguard information that is stored on the drive during offline scans and verifies a defect-free status or recommends the Extended Test. The Quick Test test takes approximately 90 seconds.

   Extended Test begins checking the drive for defects at your request and presents the results in approximately 10 to 40 minutes.

7. Press **R** to test the drive.

   When the test is complete, the Verify Drive window displays.

Data Lifeguard Diagnostics reports the status of the hard drive. Here is a list of status messages and descriptions.

Status Message	Description
No Errors Detected For This Drive	The hard drive is defect free. The problem is related to the BIOS, corrupt operating system files, or a virus.
Non-WD Drive Detected	Data Lifeguard Diagnostics cannot return a non-Western Digital hard drive to defect-free status. Contact your hard drive manufacturer. or The latest release of WD Data Lifeguard Tools are not installed. Download latest version from WD web site at www.westerndigital.com
Contact WD Tech Support	The hard drive is damaged and cannot be restored to a defect-free status, and it should be replaced. Write down the Final Code number and message. Call Western Digital Technical Support.
Restore the Hard Drive to a Defect-Free Status	The hard drive has errors. Use the Repair Drive option to attempt to repair the hard drive. Data on the hard drive is only lost when tracks are relocated, not when sectors are relocated. A warning message displays whenever this occurs. **Relocate tracks only after you have backed up the data on the hard drive**. After completing the Repair Drive option, Data Lifeguard Diagnostics scans the drive to verify the hard drive's defect-free status.

Follow the instructions that relate to your status message. Press ENTER to return to Data Lifeguard Diagnostics main menu.

8. To close, select **Quit** from the main menu. A message displays prompting you to reset the system to reinitialize the BIOS and hard drive(s). This is best accomplished by powering off the system for 5 seconds.
9. Remove the floppy disk from the floppy drive and turn on the system.

Data Lifeguard Ultra ATA/100 Management

Included on the Data Lifeguard Tools disk is Data Lifeguard Ultra ATA/100 Management. This utility software was designed to enable or disable the Ultra ATA/100 capability on Western Digital hard drives that support this feature as well as allows you to select other configurations (Ultra ATA66 or 33) that best suit your system.

Requirements for Ultra ATA/100

- The host system chipset and BIOS or add-in controller card must support Ultra ATA/100.
- The hard drive must support Ultra ATA/100.
- A 40-pin, 80-conductor IDE cable must be attached to the host system and the hard drive.
- The operating system must be enabled for DMA transfers.

If you are unsure about your system's capabilities, contact your system motherboard or controller card manufacturer.

For more information about using Data Lifeguard Ultra ATA/100 Management, please download it from our web site at www.westerndigital.com or call Western Digital Technical Support.

Using Data Lifeguard Ultra ATA/100 Management

1. Insert the Data Lifeguard Tools disk into drive A.
2. Reboot or turn on the system. Do not run Data Lifeguard Ultra ATA/100 Management while Windows 95 or 98 or Windows Me is active.

> **Caution:** Data Lifeguard is for use in DOS only. Do not use within any other operating system or DOS shell.

3. The Data Lifeguard Tools main menu displays.
4. Select **Ultra ATA/100 Management** and carefully follow the on-screen directions.

Data Lifeguard BIOS Check

Data Lifeguard BIOS Check is included on the Data Lifeguard Tools disk to provide information for quick and accurate technical support. This utility software:

- determines system BIOS support for large capacity hard drives.
- identifies all IDE devices in the system.
- reports capacity, serial number, model number, etc.

Using Data Lifeguard BIOS Check

1. Insert the Data Lifeguard Tools disk into drive A.
2. Reboot or turn on the system. Do not run Data Lifeguard BIOS Check while Windows 95 or 98 or Windows Me is active.
3. The Data Lifeguard Tools main menu displays.

4. Select **BIOS Check** and carefully follow the on-screen directions.

Note: BIOS Check may not support some controller cards.

Data Lifeguard Lifeline

Integrated with all Data Lifeguard utilities, Data Lifeguard Lifeline is a service that enables Western Digital to quickly alert you and communicate critical issues that could affect your drive or data. Its passive design simply sends important information and updates to your drive and does not communicate any specific system or user information over the Internet. **Data Lifeguard Lifeline does not track or monitor Internet activity, usage, habits, preferences, or any personal information.**

Upon installation of the Data Lifeguard tools, Data Lifeguard Lifeline downloads a small (100KB) initiation program that in turn retrieves the full Lifeline program from the Western Digital server in the background while your system is connected to the Internet. The balance of the program is retrieved only while the user is online but not active and does not impact system or browser performance.

Uninstalling Data Lifeguard Lifeline

1. Determine if Lifeline is active by looking for the utility name **Data Lifeguard Agent** in the Windows Task Manager.

   If **Data Lifeguard Agent** is present in the Windows Task Manager, uninstall the utility from the Control Panel as follows.

2. Click on the **Start** button and select the following options: **Settings**, **Control Panel**, then **Add/Remove Programs**.
3. Select the program name **Data Lifeguard Agent** and follow instructions as prompted.

Troubleshooting

This section contains information on the following topics:

- Operating System and System BIOS Limitations
- Alternate Jumper Settings
- Non-Western Digital Support Information

For a list of frequently asked troubleshooting questions, visit our web site at www.westerndigital.com.

Operating System and System BIOS Limitations

Computer operating systems and system BIOSs have separate limitations that are related to specific hard drive capacities. The capacity points that can affect how your operating system and system BIOS support your hard drive are 32 GB, 8.4 GB, 2.1 GB, and 528 MB. A brief description of these limitations follow.

32 GB Barrier

Some BIOSs released before June 1999 stall with drives larger than 32 GB. If you are installing a hard drive larger than 32 GB and your system stalls before floppy or hard drive boot can take place, you may have a system BIOS that is incompatible with this larger hard drive. Follow these instructions only if your system stalls when adding a drive larger than 32 GB.

Recommended Solution: Contact your system or motherboard manufacturer for a BIOS upgrade.

Interim Solution: Follow the steps below using the Western Digital Data Lifeguard Tools disk included in your hard drive kit. With this solution, you will not be able to warm boot your system (**<CTRL><ALT><DEL>**) or **Restart** from the Windows menu. You

must always choose **Shut Down** from the menu and power down the system when prompted.

1. Jumper your hard drive per the instructions on page 35.
2. EZ-BIOS must be used to access the full capacity of the hard drive when these jumper settings are used. To run EZ-BIOS:
   a. Insert the Data Lifeguard Tools disk into your floppy drive.
   b. Boot your system and use the Fully Automatic Installation option (see page 21 for a detailed description). This will install EZ-BIOS on your system and allow your system to access the full capacity of your hard drive.

8.4 GB Barrier

There is an 8.4 GB hard drive limitation on some traditional system BIOSs. To access the full capacity of 8.4 GB and larger hard drives, your system BIOS must support extended BIOS functions, and your operating system must recognize extended BIOS functions. It is difficult to determine if your system BIOS supports 8.4 GB or larger hard drives. We recommend using the latest Data Lifeguard EZ-Install software to ensure support of the full capacity of your hard drive. Visit our web site at www.westerndigital.com for the latest version. Other options are to upgrade your system BIOS or purchase a controller card. Contact your system or motherboard manufacturer for a BIOS Flash or more information. See page 37 for a list of common system manufacturers and BIOS upgrade sources.

The following operating systems recognize extended BIOS functions.

- Windows 95 (OEM SR2)
- Windows 98 and Windows 98 Second Edition
- Windows Me
- Windows 2000
- Windows NT with Service Pack 4 or later

The following operating systems do not recognize extended BIOS functions. See the table that follows for limitations and exceptions.

- DOS 6.xx and earlier
- Windows 3.1x
- Windows NT
- Novell NetWare
- OS/2 Warp

Operating System	Limitations and Exceptions
DOS 6.xx and earlier Windows 3.1x	8.4 GB maximum capacity limit. Hard drive capacities larger than 8.4 GB are recognized as 8025MB.
Windows 95	Does not support drives larger than 32 GB.
Windows NT	Windows NT 4.0 with Service Pack 4 or later recognizes hard drives larger than 8.4 GB.
Novell NetWare	Novell NetWare 4.11 drivers are available to support capacities larger than 8.4 GB. Novell NetWare 5 supports 8.4 GB and larger hard drives.
OS/2 Warp	Requires patch to support 8.4 GB or larger hard drives.

2.1 GB Barrier

Some computer systems built before February 1996 do not support hard drives with more than 4095 cylinders (hard drives larger than 2.1 GB), unless you update the system BIOS, install an EIDE controller card with onboard BIOS, or use Data Lifeguard EZ-Install software.

528 MB Barrier

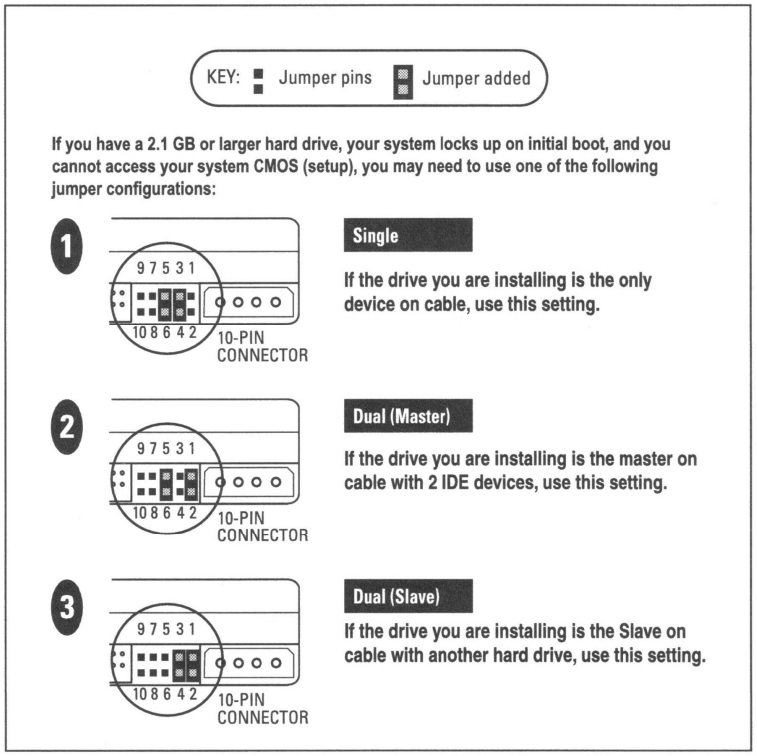
Most computer systems built before August 1994 do not support hard drives larger than 528 MB, unless you update the system BIOS, install an EIDE controller card with onboard BIOS, or use Data Lifeguard EZ-Install software.

Alternate Jumper Settings

Hard drive capacities continue to increase at a phenomenal rate. As a result, some legacy computer BIOSs have compatibility issues with large capacity hard drives. Three capacity points have been indentified as BIOS barriers that could cause a system BIOS to lock up on initial boot. These capacities are 2.1 GB, 8.4 GB, and 32 GB.

Alternate jumper settings are provided on WD Caviar drives to overcome the system BIOS limitations. These jumper settings cause the drive to report a smaller capacity to work around the BIOS issues. If you use these jumper settings, you MUST install Data Lifeguard EZ-Install software to access the full capacity of your hard drive.

Note: Cable Select jumpering cannot be used when alternate jumpers are selected.



Note: Do not use these alternate jumper settings in Novell NetWare or Unix systems

Non-Western Digital Support Information

Computer System Manufacturers

Common System Manufacturers	USA Phone Number	Common System Manufacturers	USA Phone Number
ACER	408.432.6200	HP	208.323.2551
Apple	888.APL.VALU	IBM	800.IBM4YOU
Compaq	800.652.6672	Micron	888.349.6972
Dell	888.560.8324	NEC	800.632.4525
Gateway	800.846.4208	Packard Bell	801.578.5108

Common System BIOS Sources

The following table lists the USA phone numbers for common system BIOS sources.

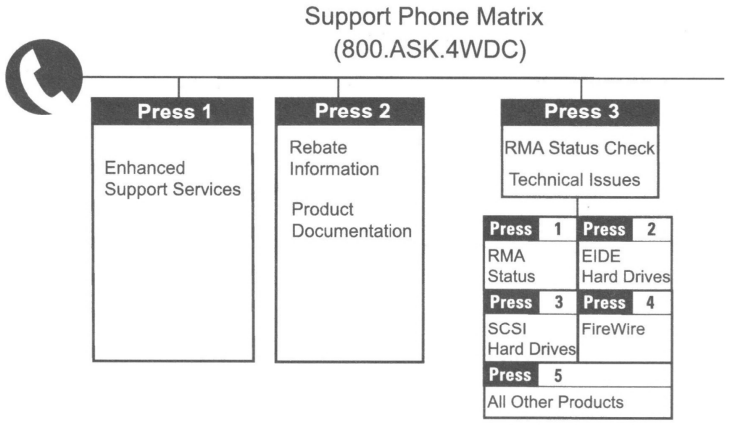
BIOS Source	USA Phone Number	Internet Address
Micro Firmware (Phoenix BIOS only)	405.321.8333	www.firmware.com
Unicore (Award and AMI BIOS)	978.686.2204	www.unicore.com

Other Drive Manufacturers

When installing your new Western Digital hard drive with a non-Western Digital hard drive, you may have to contact the manufacturer for master/slave jumper configuration information.

Drive Manufacturer	USA Phone Number	Internet Address
Fujitsu	800.591.5924	www.fujitsu.com
IBM	800.IBM4YOU	www.ibm.com
Maxtor	408.432.1700	www.maxtor.com
Seagate	800.SEAGATE	www.seagate.com

Western Digital Technical Support



Appendix

This appendix contains information on the following topics:

- Agency Approvals
- Radio Frequency Interference Statement
- Warranty Information

Agency Approvals

Western Digital hard drives meet the standards of the following regulatory agencies:

Federal Communication Commission

Verified to comply with FCC Rules for Radiated and Conducted Emission, Part 15, Subpart B, for Class B Equipment.

Underwriters Laboratories

UL-Standard 1950, Standard for Safety of Information Technology Equipment including Electrical Business Equipment (File E101559).

Canadian Standards Association

CSA-Standard C22.2, No. 950-M89, Standard for Safety of Information Technology Equipment including Electrical Business Equipment (File LR68850).

TUV Essen Laboratories

IEC-950 (EN60950) Standard for Safety of Information Technology Equipment including Electrical Business Equipment.

CE Compliance For Europe

Verified to comply with EN55022 for RF Emissions and EN50082-1 for Generic Immunity, as applicable.

Radio Frequency Interference Statement

FCC Notice

This Western Digital product has been verified to comply with the limits for a Class B computing device pursuant to subpart B Part 15 of FCC rules. This does not guarantee that interference will not occur in individual installations. Western Digital is not responsible for any television, radio, or other interference caused by unauthorized modifications to this product.

If interference problems do occur, please consult the system equipment owner's manual for suggestions. These suggestions may include relocation of the computer system away from the television or radio, or placing the computer AC power connection on a different circuit or outlet.

CSA Notice

Le prent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B préscrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

This digital apparatus does not exceed the Class B limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Warranty Information

Obtaining Service

Western Digital ("WD") values your business and always attempts to provide you the very best of service. No limited warranty is provided by WD unless your WD Product ("Product") was purchased from an authorized distributor or authorized reseller. Distributors may sell Products to resellers who then sell Products to end users. Please see below for warranty information or obtaining service. No warranty service is provided unless the Product is returned to an authorized return center in the region (Americas, Europe-Middle East-Africa, or Asia Pacific) where the Product was first shipped by WD. If your Product was purchased as a component integrated within a system by a system manufacturer, no limited warranty is provided by WD. Please contact the place of purchase or the system manufacturer directly for warranty service.

Return Material Authorization

No Product may be returned directly to WD without first contacting WD for a Return Material Authorization ("RMA") number. If it is determined that the Product may be defective, you will be given an RMA number and instructions for Product return. An unauthorized return, i.e. one for which an RMA number has not been issued, will be returned to you at your expense. Authorized returns are to be shipped pre-paid and insured to the address on the RMA in an approved shipping container. Your original box and packaging materials should be kept for storing or shipping your Product. For information on approved shipping containers, visit our web site at www.westerndigital.com and go to **Service and Support**.

Limited Warranty

WD's limited warranty provides that, subject to the following limitations, each Product will be free from defects in material and workmanship and will conform to WD's specification for the particular Product.

Duration of Warranty

The warranty period commences from the date of manufacture appearing on the Product label of the original Product purchase. To verify this period for your Product, please visit our web site at www.westerndigital.com and go to **Service and Support**. In the United States, some states do not allow limitations on how long implied warranties last, so the above limitation may not apply to you.

Other Warranty Limitations

For further important information on limitations on WD's warranty, please see below and visit our web site at www.westerndigital.com and go to **Additional Product Warranty Limitations**.

Disclaimer of Warranties

There are no warranties which extend beyond the face of the WD limited warranty. WD disclaims all other warranties, express or implied, regarding the Products, including any implied warranties of merchantability, fitness for a particular purpose or noninfringement. In the United States, some laws do not allow the exclusion of the implied warranties.

Your Use of the Product

WD will have no liability for any Product returned if WD determines that:

- The product was stolen from WD.
- The asserted defect:
  - A. is not present,
  - B. cannot reasonably be fixed because of damage occurring when the Product is in the possession of someone other than WD, or
  - C. is attributable to misuse, improper installation, alteration (including removing or obliterating labels), accident or mishandling while in the possession of someone other than WD.
- The Product was not sold to you as new.

Limitation of Remedies

Your exclusive remedy for any defective Product is limited to the repair or replacement of the defective Product.

WD may elect which remedy or combination of remedies to provide in its sole discretion. WD shall have a reasonable time after determining that a defective Product exists to repair or replace a defective Product. WD's replacement Product under its limited warranty will be manufactured from new and serviceable used parts. WD's warranty applies to repaired or replaced Products for the balance of the applicable period of the original warranty or ninety days from the date of shipment of a repaired or replaced Product, whichever is longer.

Limitation of Damages

WD's entire liability for any defective Product shall in no event exceed the purchase price for the defective Product. This limitation applies even if WD cannot or does not repair or replace any defective Product and your exclusive remedy fails of its essential purpose.

No Consequential or Other Damages

WD has no liability for general, consequential, incidental or special damages. These include loss of recorded data, the cost of recovery of lost data, lost profits and the cost of the installation or removal of any Products, the installation of replacement Products, and any inspection, testing, or redesign caused by any defect or by the repair or replacement of Products arising from a defect in any Product.

In the United States, some states do not allow exclusion or limitation of incidental or consequential damages, so the limitations above may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Online Warranty Inquiry

For further warranty information and inquiries, visit our web site at www.westerndigital.com and go to **Service and Support**. The new online Warranty Inquiry System will provide warranty status based on the serial number of the Product.

Extended Warranty

Certain WD products may be eligible for purchase of additional or extended warranty options. For further details, please check our web site at www.westerndigital.com and go to **Service and Support.**